Serverless Websites con Blazor e Azure Functions

Saturday Innova community

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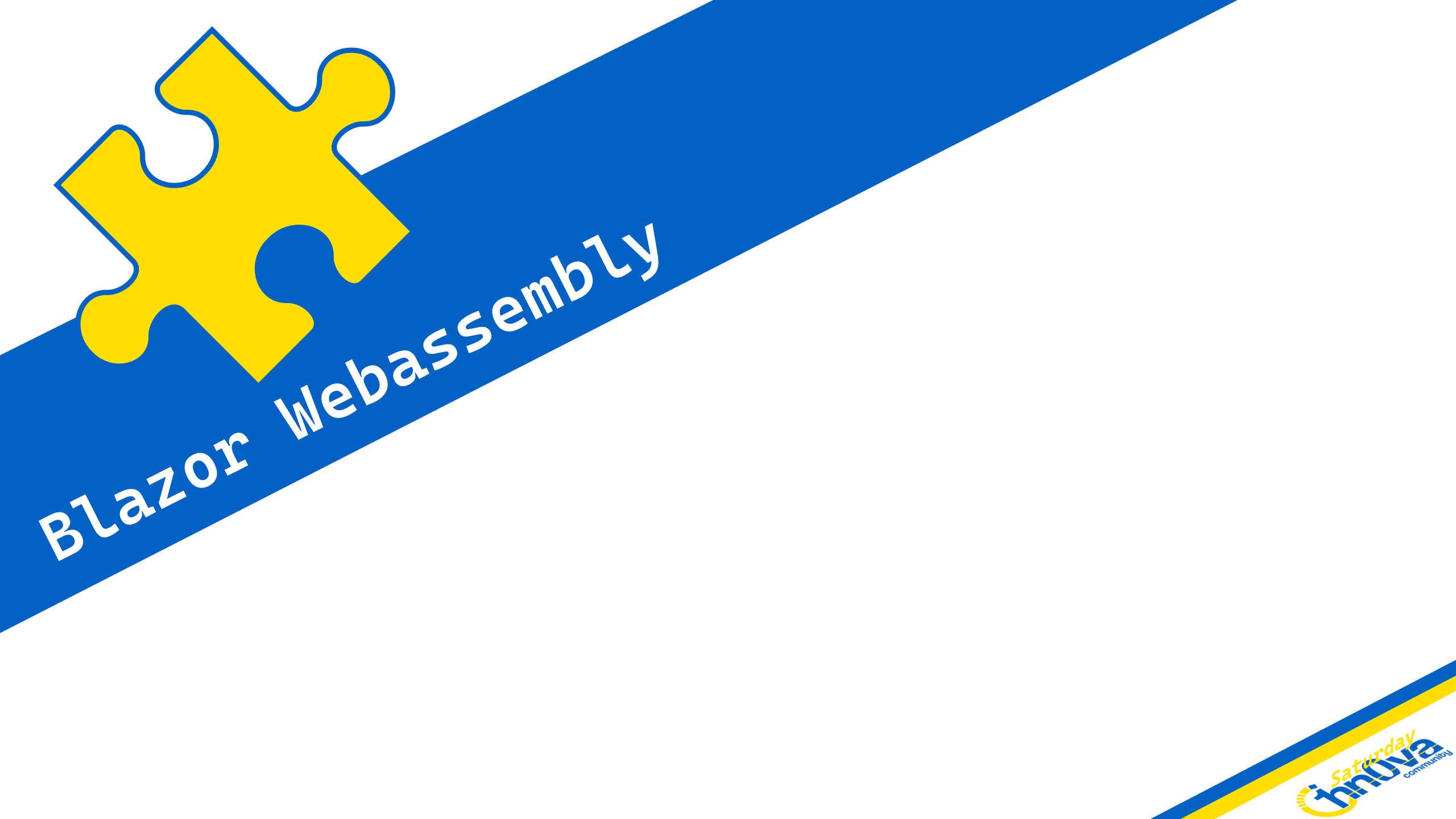
Blazor Webassembly

Blazor Webassembly

The Blazor WebAssembly hosting model runs components client-side in the browser on a WebAssembly-based .NET runtime.

Razor components, their dependencies, and the .NET runtime are downloaded to the browser.

Components are executed directly on the browser UI thread. UI updates and event handling occur within the same process.

Assets are deployed as static files to a web server or service capable of serving static content to clients.
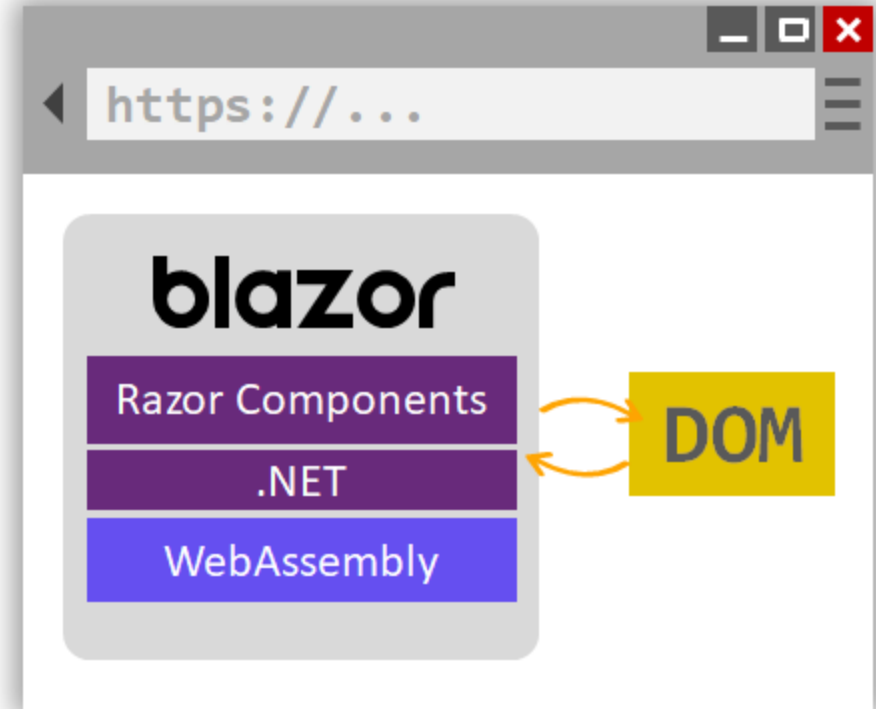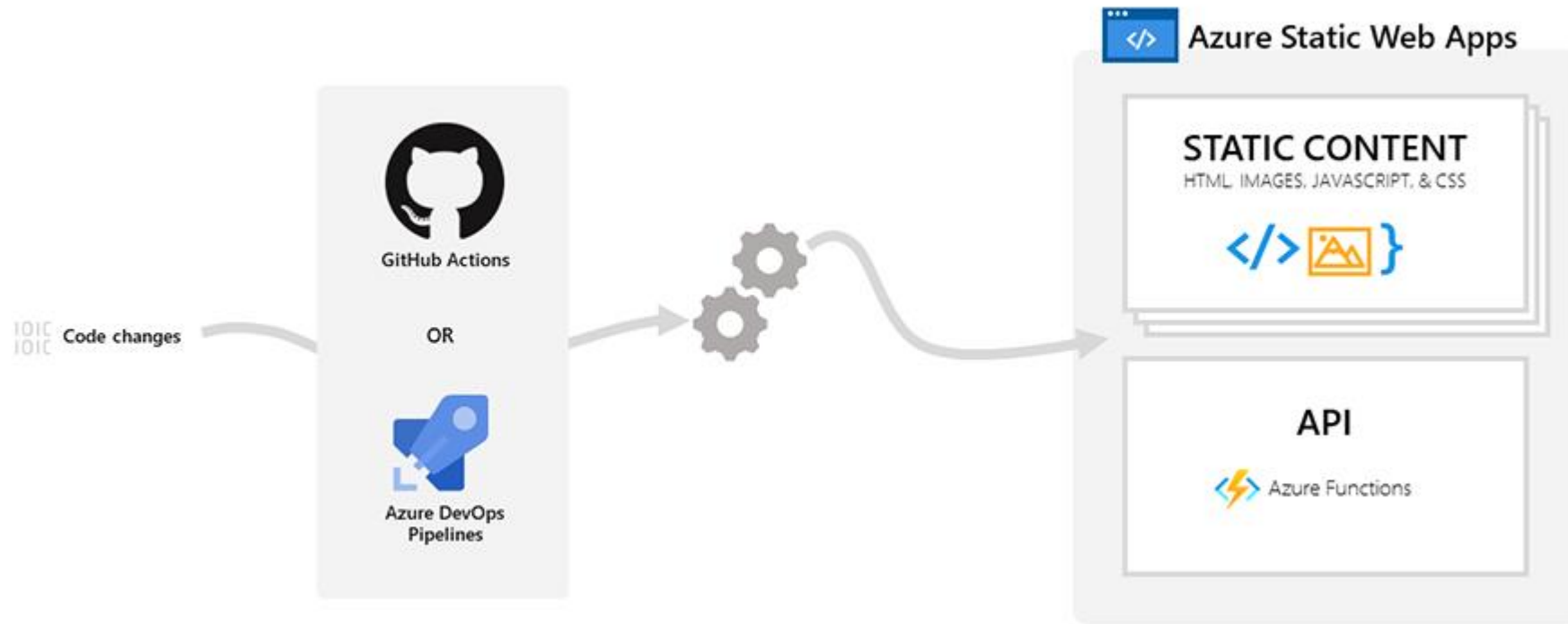
Azure Static Web App

Azure Static Web App

Azure Static Web Apps is a service that **automatically builds and deploys** full stack web apps to Azure from a code repository.

Azure Static Web Apps – hosting plans

Feature	Free plan	Standard plan
Web hosting	✓	✓
GitHub integration	✓	✓
Azure DevOps integration	✓	✓
Globally distributed static content	✓	✓
Free, automatically renewing SSL certificates	✓	✓
Staging environments	3 per app	10 per app
Max app size	250 MB per app	500 MB per app
Custom domains	2 per app	5 per app
APIs via Azure Functions	Managed	Managed or Bring your own Functions app
Authentication provider integration	Pre-configured	Custom registrations
Assign custom roles with a function	–	✓
Private endpoints	–	✓
Service Level Agreement (SLA)	None	✓

Azure Static Web Apps – pricing

	Free	Standard
Price	Free[*]	€8.312/per app/month[**]
Included Bandwidth	100 GB per subscription	100 GB per subscription
Bandwidth Overage	N/A	€0.185 per GB per sub
SSL Certificates	Free	Free
Enterprise-grade edge	N/A	€16.179/per app/month
Database connections	Free during public preview	Free during public preview
SLA	N/A	

Enterprise-grade edge

Use Azure Static Web Apps enterprise-grade edge to enable faster page loads, enhance security, and optimize reliability for your global applications. Enterprise edge ==combines the capabilities of Azure Static Web Apps, Azure Front Door, and Azure Content Delivery Network== (CDN) into a single secure cloud CDN platform.

- Global presence in 118+ edge locations across 100 metro cities.

- Caching assets at the edge.

- Proactive protection against Distributed Denial of Service (DDoS) attacks.

- Native support of end-to-end IPv6 connectivity and HTTP/2 protocol.

- Optimized file compression.

Azure Static Web App – Configuration

Application configuration: Define rules in the staticwebapp.config.json file to control application behavior and features. Use this file to define route and security rules, custom headers, and networking settings.

Build configuration: Define settings that control the build process.

Application settings: Set application-level settings and environment variables that can be used by backend APIs.

staticwebapp.config.json

- Routing
- Authentication
- Authorization
- Fallback rules
- HTTP response overrides
- Global HTTP header definitions
- Custom MIME types
- Networking

DEMO

staticwebapp.config.json

GitHub Actions

Azure Static Web App – Build configuration

The Azure Static Web Apps build configuration is powered either by GitHub Actions or Azure Pipelines.

Each site has a YAML configuration file that controls how a site is built and deployed.

```yaml
with:
  azure_static_web_apps_api_token: ${{ secrets.AZURE_STATIC_WEB_APPS_API_TOKEN }}
  repo_token: ${{ secrets.GITHUB_TOKEN }} # Used for GitHub integrations (i.e. PR comments)
  action: "upload"
  ###### Repository/Build Configurations ######
  app_location: "src" # App source code path relative to repository root
  api_location: "api" # Api source code path relative to repository root - optional
  output_location: "public" # Built app content directory, relative to app_location - optional
  ###### End of Repository/Build Configurations ######
```

Preview environments in Azure Static Web Apps

By default, when you deploy a site to Azure Static Web Apps each pull request deploys a preview version of your site available through a temporary URL. ==This version of the site allows you to review changes before merging pull requests==. Once the pull request (PR) is closed, the temporary environment disappears.

The URLs for preview environments take on the following form:

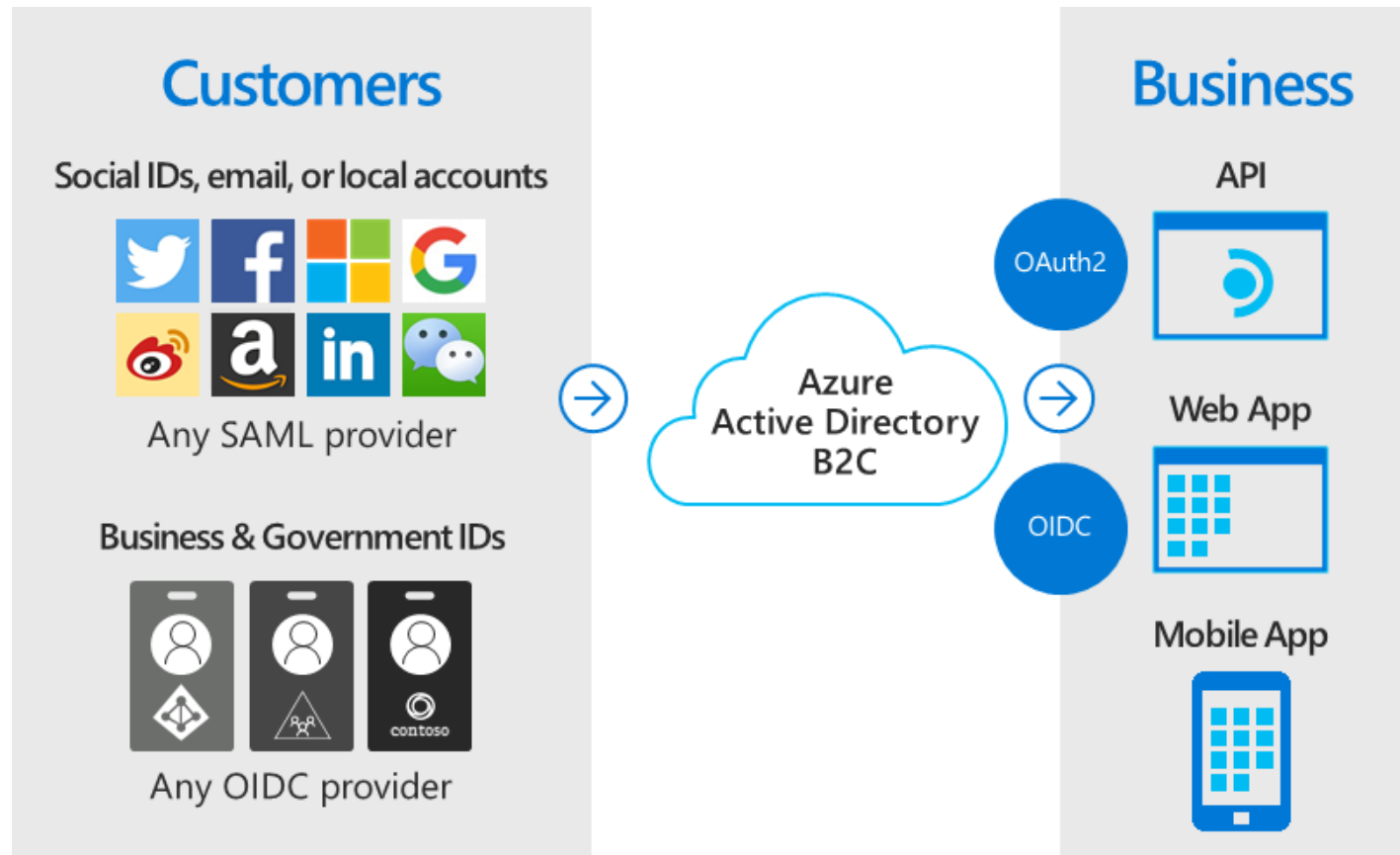- <DEFAULT_HOST_NAME>-<BRANCH_OR_ENVIRONMENT_NAME>.<LOCATION>.azurestaticapps.net

DEMO

azure-static-web-apps-red-mud-0f7084f03.yml

Azure b2c

Authentication: Azure Active Directory B2C

Azure Active Directory B2C provides business-to-customer identity as a service. Your customers use their preferred social, enterprise, or local account identities to get single sign-on access to your applications and APIs.

Authentication: Azure Active Directory B2C

Customize every page displayed by Azure AD B2C when your users sign-up, sign in, and modify their profile information. Customize the HTML, CSS, and JavaScript in your user journeys so that the Azure AD B2C experience looks and feels like it's a native part of your application.
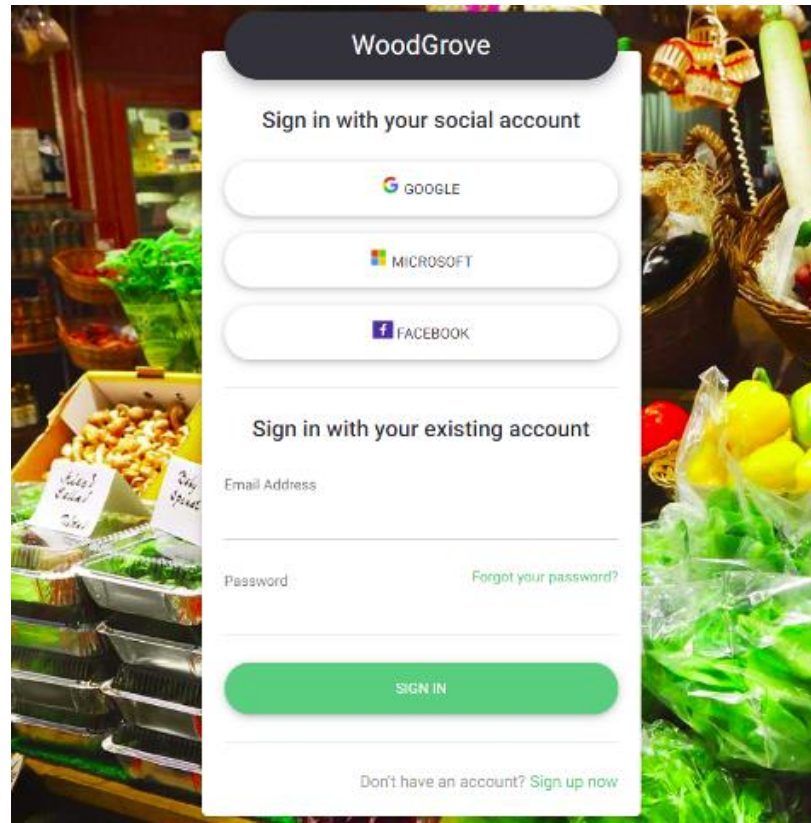
Authentication: Azure Active Directory B2C

## Pricing is based on monthly active users (MAU)

	Premium P1	Premium P2
First 50,000 MAU	€0/Monthly Active Users	€0/Monthly Active Users
More than 50,000 MAU	€0.003002/Monthly Active Users	€0.015007/Monthly Active Users

Separate Charges:

- A flat fee of €0.028 is billed for each SMS/Phone-based multi-factor authentication attempt.

DEMO

staticwebapp.config.json
StaticWebAppsAuthenticationStateProvider
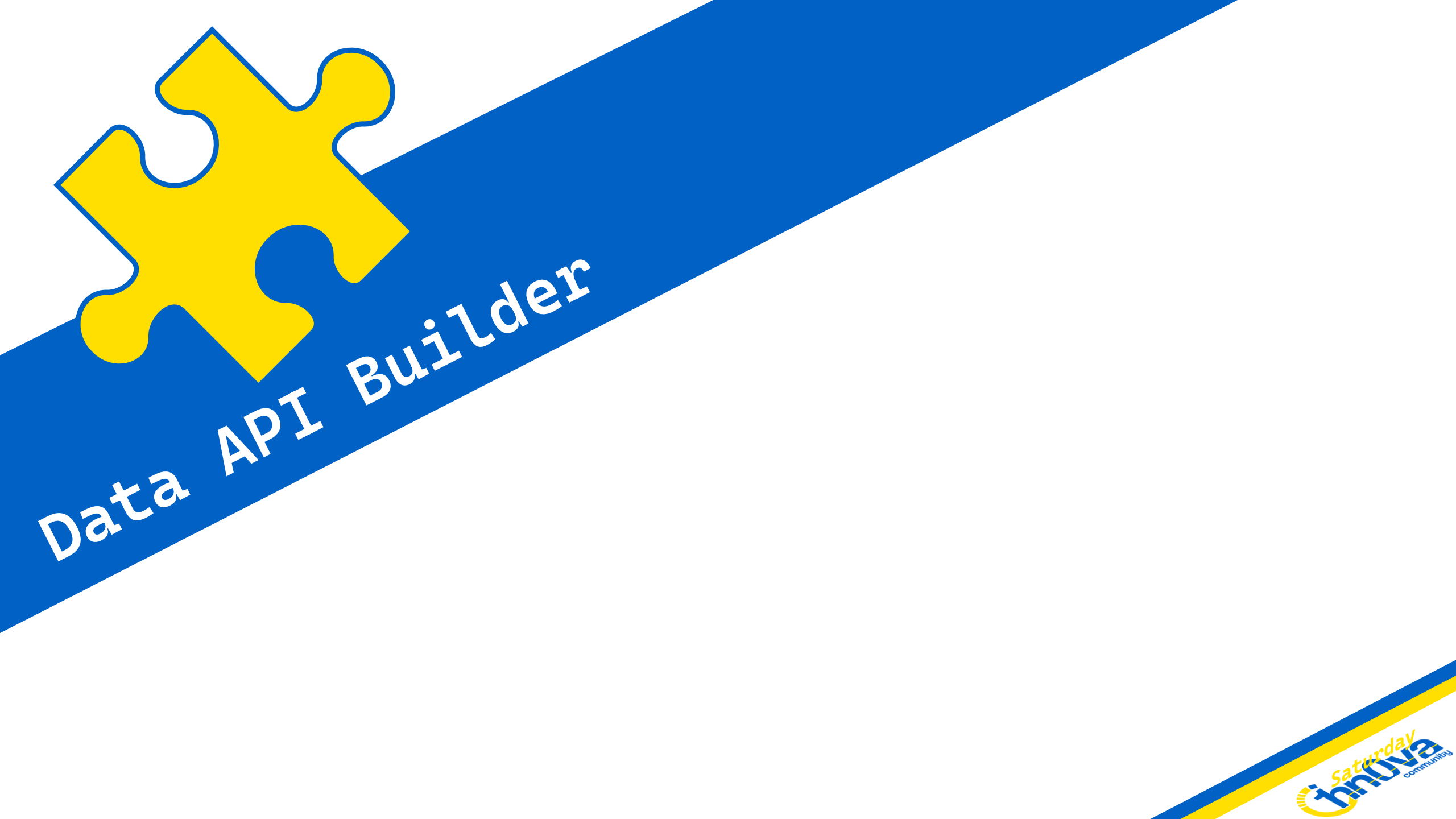
Data API Builder

Data API Builder

- Allow collections, tables, views and stored procedures to be accessed via ==REST and GraphQL==
- Works with Azure SQL, SQL Server, PostgreSQL, MySQL and Cosmos DB,
- ==Support authentication== via OAuth2/JWT
- Support for EasyAuth when running in Azure
- Role-based authorization using received claims
- ==Item-level security== via policy expressions
- Full integration with Static Web Apps via Database Connection feature when running in Azure
- Open Source

Data API Builder
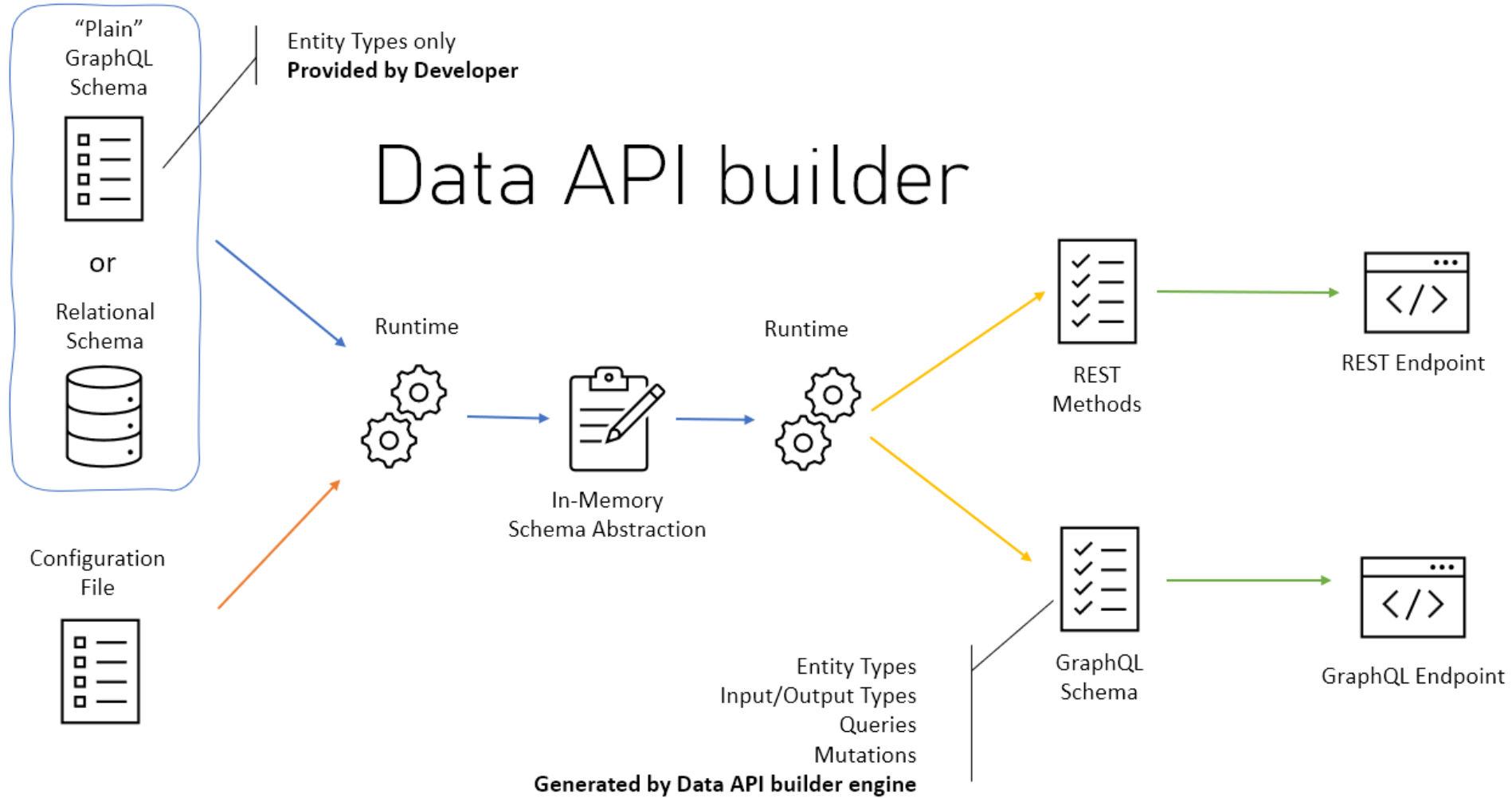
Data API Builder for your Static Web Apps

The Azure Static Web Apps database connection feature allows you to access a database from your static web app without writing custom server-side code.

Free during public preview

==/data-api== prefix is a convention of Static Web Apps and can't be changed.

Link existing database ✕

Environment name	Production
Database type *	Azure SQL Database ⌄
Subscription *	Visual Studio Enterprise Subscription ⌄
Resource group *	xe ⌄
Resource name *	dottor ⌄
Database name * ⓘ	blazor-swa ⌄
Authentication type * ⓘ	Connection String ⌄
Username *	dottor
Password *	•••••••••••

DEMO

`staticwebapp.database.config.json`
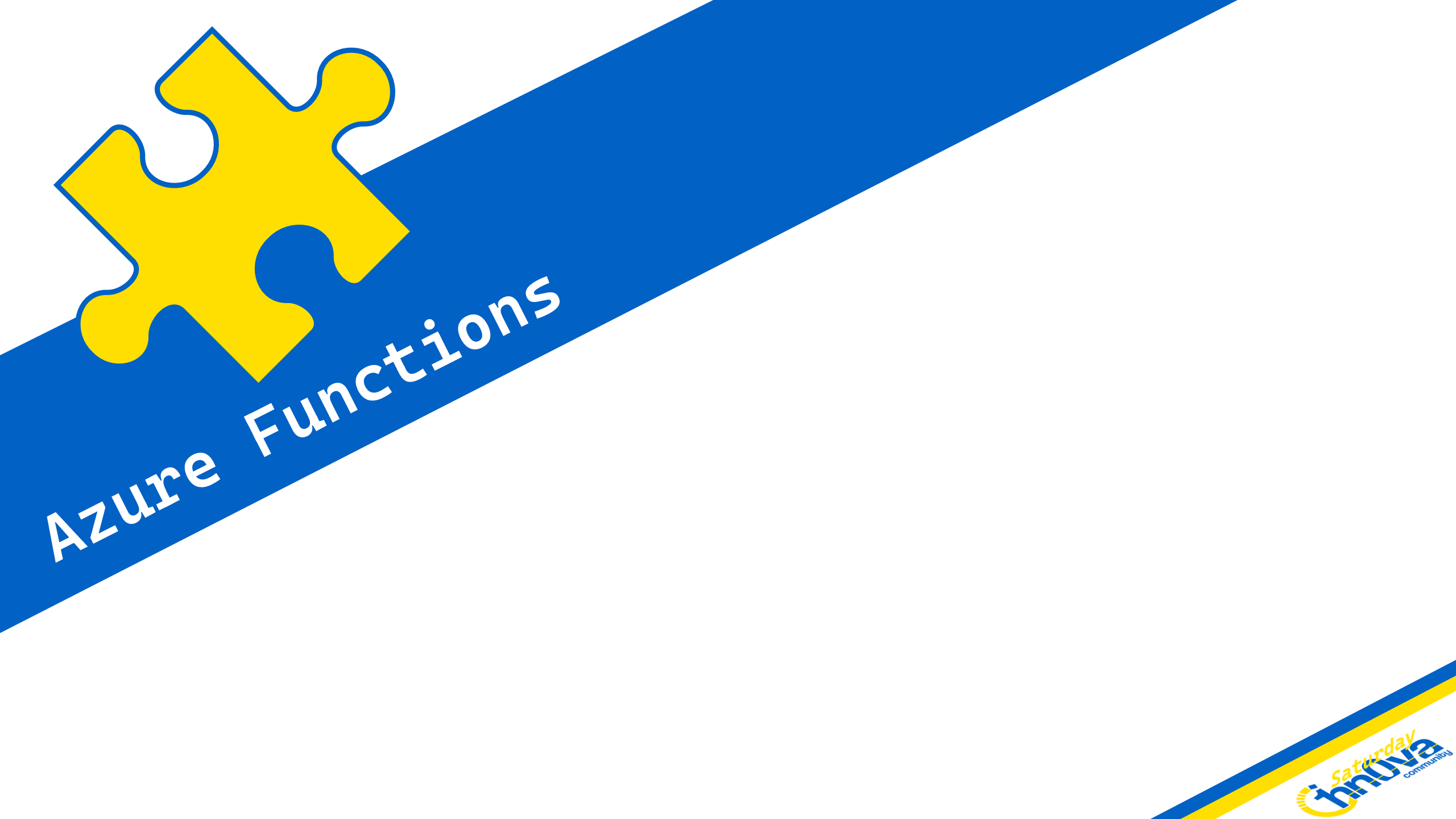
Azure Functions

Azure Static Web App – API

Azure Functions APIs in Static Web Apps are supported by two possible configurations depending on the hosting plan:

Managed APIs: By default, Azure Static Web Apps automatically integrates with Azure Functions as an API backend. You deploy an API with your static web app without managing a separate Azure Functions resource.

Bring your own APIs: You can integrate your static web app with existing APIs hosted in Azure Functions, API Management, App Service, or Container Apps. You manage and deploy the API resources yourself.

Azure Static Web App – Bring your own APIs

Azure Static Web Apps provides built-in serverless API endpoints via integration with Azure services.

- Azure Functions   (Free & Standard)
- Azure API Management   (Standard)
- Azure App Service   (Standard)
- Azure Container Apps   (Standard)

Azure Static Web App – API constraints

- Each static web app environment can only be configured with one type of backend API at a time.
- The API route prefix must be `/api`.
- Route rules for APIs only support redirects and securing routes with roles.
- Only HTTP requests are supported for APIs. WebSocket, for example, is not supported.
- The maximum duration of each API request 45 seconds.
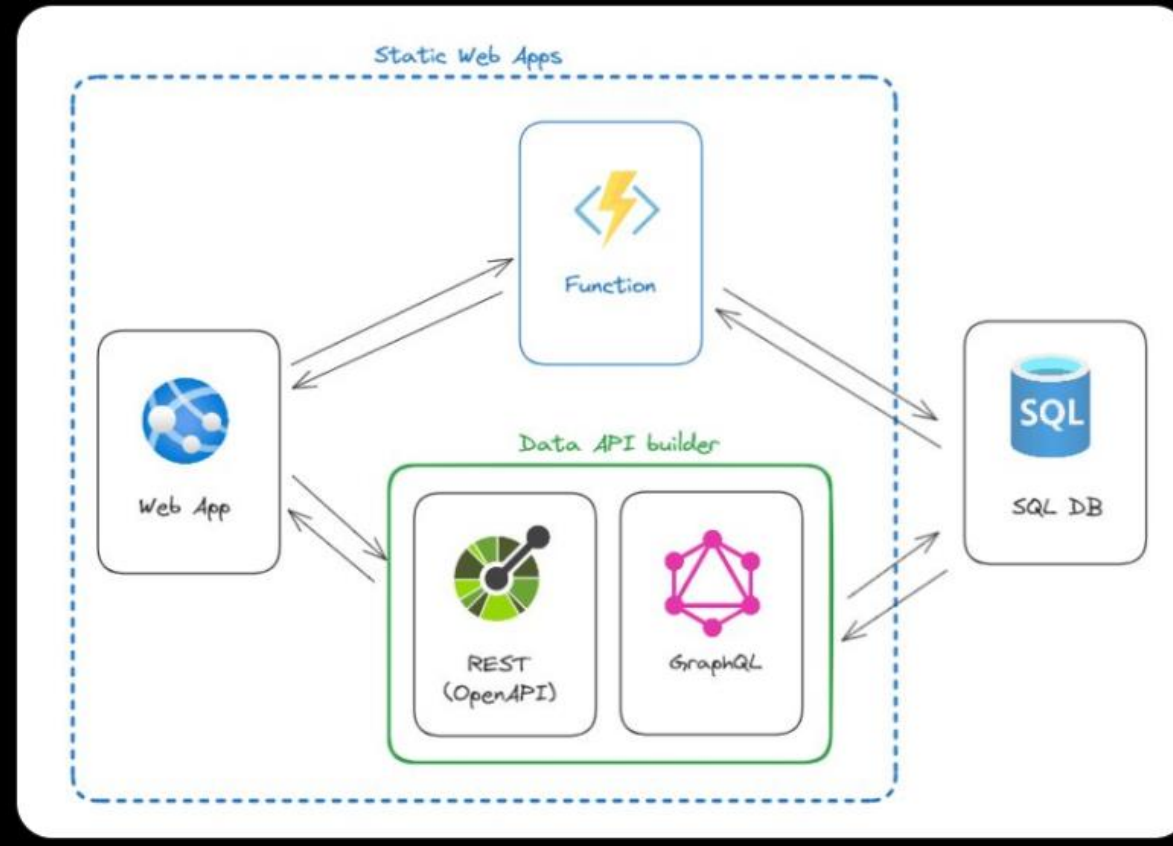- Network isolated backends are not supported.

DEMO

Static Web Apps, Azure Function, and AzureSQL DB for free

Links

- Azure Static Web App
  - https://learn.microsoft.com/en-us/azure/static-web-apps/
  - https://github.com/MollsAndHersh/swa-authentication/
  - https://learn.microsoft.com/en-us/training/modules/publish-app-service-static-web-app-api-dotnet/
- Azure B2C
  - https://learn.microsoft.com/en-us/aspnet/core/blazor/security/webassembly/hosted-with-azure-active-directory-b2c?view=aspnetcore-7.0
- Azure Functions
  - https://learn.microsoft.com/en-us/azure/azure-functions/functions-overview
- Data API Builder
  - https://learn.microsoft.com/en-us/azure/data-api-builder/
  - https://youtu.be/bqGuvTwqJTo?si=YbpujucqWBlJK4dW
  - https://techcommunity.microsoft.com/t5/educator-developer-blog/seamless-api-development-with-data-api-builder-for-your-static/ba-p/3859712

Andrea Dottor

```
{
    mail:    andrea@dottor.net,
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    github:  https://github.com/andreadottor
}
```

Thanks!

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